

Patent Application No. 10/690,113

REMARKS

This Amendment is in response to the Office Action dated January 10, 2006 ("OA"). In the Office Action, claims 1-9, 17-20 and 22-23 were rejected under 35 USC §102. Claim 21 was rejected under 35 USC §103. By this Amendment, claims 1-3 and 17 are amended, and claims 27-31 are added. Currently pending claims 1-9, 17-23 and 27-31 are believed allowable, with claims 1, 17 and 18 being independent claims.

OBJECTION TO TITLE:

The title of the present application was objected to as not being descriptive. By this amendment, the title is amended to "SHIELDING STRUCTURE FOR OUTER CIRCUIT BOARD CONDUCTIVE TRACES." This change is believed to overcome the Examiner's objection to the title..

CLAIM REJECTIONS UNDER 35 USC §112:

Claim 3 was rejected under 35 USC §112 as allegedly failing to particularly point out and distinctly claim the subject matter of the invention.

From the Examiner's comments, the rejection appears to be directed to claim 2 rather than claim 3. By this amendment, the term "signal trace" has been changed to "conductive trace", and is believed to overcome the rejection.

CLAIM REJECTIONS UNDER 35 USC §102 and §103:

Claims 1-9 and 17 were rejected under 35 USC §102 as allegedly anticipated by U.S. Patent No. 6,353,189 issued to Shimada et al. ("Shimada"). Claims 18-20 and 22-23 were rejected under 35 USC §102 as allegedly anticipated by U.S. Patent No. 4,816,616 issued to Jones ("Jones"). Claim 21 was rejected under 35 USC §103 as allegedly obvious over the combined teachings of Shimada and Jones.

To anticipate a claim under 35 USC §102, a reference must teach every element of the claim. MPEP 2131. Under an anticipation rejection, the identical invention must be shown in as complete detail as is contained in the claim. MPEP 2131 citing *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

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Claim 1:

Claim 1 recites, in part, "A trace cover suitable for shielding a conductive trace on a circuit board." In rejecting claim 1, the Office Action alleges Shimada discloses a trace cover suitable for shielding a conductive trace. OA, pg. 3. The Examiner calls attention to "line 1" illustrated in figure 1 of Shimada. OA, pg. 3. The Applicants respectfully disagree with such an interpretation of Shimada.

Shimada states, "A wiring board of the present invention comprises a transmission line, a shielding means that is disposed so as to encircle the surroundings of the transmission line along the transmission line and shields the transmission line, and an insulating layer disposed between the transmission line and the shielding means." Shimada, col. 4, ln. 10-16 (emphasis added). Shimada further states, "A wiring board of the present invention is a multi-layered wiring board in which a plurality of wiring layers and a plurality of insulating layers are stacked" Shimada, col. 8, ln. 8-14. Thus, rather than disclosing a trace cover suitable for shielding a conductive trace on a circuit board, Shimada discloses a circuit board (wiring board) with integrated transmission line shielding.

Turning to Fig. 1 of Shimada, as shown below, it is evident that this drawing does not illustrate a trace cover, but rather a portion of multi-layer circuit board with integrated shielding around a transmission line 1. Shimada, Fig. 1. In other words, the assembly shown in Fig. 1 of Shimada cannot be characterized as on the circuit board since it is part of the circuit board.

In comparison, claim 1 recites a trace cover suitable for shielding a conductive trace on a circuit board. A trace cover is illustrated in Fig. 3 of the present application (shown below). This figure illustrates the trace cover 18 placed on the circuit board 104, over the conductive trace 116.

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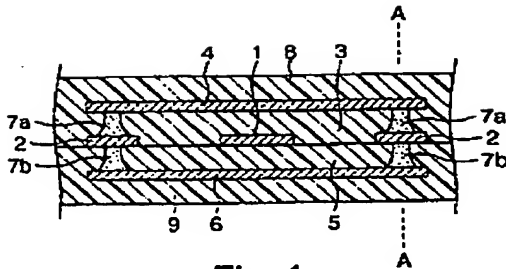


Fig. 1
Shimada

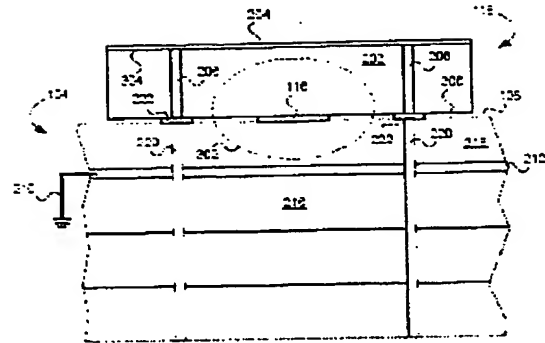


Fig. 3
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For at least these reasons, claim 1 is believed allowable over the cited art. The Applicant respectfully request reconsideration and allowance of claim 1.

Claims 2-9 and 27-29:

Claims 2-9 and 27-29 are dependent on and further limit claim 1. Since claim 1 is believed allowable for the reasons discussed above, claims 2-9 and 27-29 are also believed allowable for at least the same reasons as claim 1.

Claim 17:

Claim 17 recites, in part, "a conductive trace disposed on an outer surface of the circuit board; and means for shielding the conductive trace." The Applicants respectfully submit that Shimada does not teach or suggest a means for shielding a conductive trace disposed on an outer surface of a circuit board.

As discussed above, Shimada describes a wiring board with integrated transmission line shielding. As shown in Fig. 1 of Shimada, the circuit board construction includes conductive layers above and below the signal wire (layer 4 and layer 6 over and under line 1). Shimada, Fig. 1. Shimada states, "A wiring board of the present invention comprises a transmission line, a shielding means that is disposed so as to encircle the surroundings of the transmission line along the transmission line and shields the transmission line, and an insulating layer disposed between the transmission line and the shielding means." Shimada, col. 4, ln. 10-16 (emphasis added).

On the other hand, claim 17 recites means for shielding a conductive trace disposed on an outer surface of a circuit board. The Applicants

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respectfully submit that Shimada does not disclose or suggest such construction because the shielding of Shimada is part of the circuit board, thereby burying the wire being shielded under additional circuit board layers.

For at least this reason, claim 17 is believed allowable over the cited art. The Applicant respectfully request reconsideration and allowance of claim 17.

Claim 18:

Claim 18 recites, in part, "A trace cover suitable for suppressing electromagnetic emissions from a conductive bus on a circuit board." In rejecting claim 18, the Office Action alleges Jones discloses a trace cover suitable for shielding a conductive trace. OA, pg. 6. The Examiner calls attention to Figs. 1F and 2 and column 1, lines 20-23 of Jones. OA, pg. 6. The Applicants respectfully disagree with such an interpretation of Jones.

The assembly shown in figures 1A through 1F of Jones is described as a "miniature electric assembly". Jones, col. 2, ln. 56-59. The series of illustrations demonstrate various layers of conductive and dielectric materials deposited over a substrate S. Jones, col. 2, ln. 63-66. Thus, rather than disclosing a trace cover suitable for shielding a conductive trace on a circuit board, Jones discloses a miniature electric assembly with integrated transmission line shielding.

Furthermore, the cited passage of Jones states, "Voltage referenced electrical conductors or transmission lines must be uniform, properly terminated and isolated from each other to avoid electromagnetic interference between adjacent circuits." Jones, col. 1, ln. 20-23. The Applicants respectfully submit that this Jones passage does not disclose or suggest a trace cover suitable for suppressing electromagnetic emissions from a conductive bus on a circuit board.

For at least these reasons, claim 18 is believed allowable over the cited art. The Applicant respectfully request reconsideration and allowance of claim 18.

Claims 19-23, 29 and 30:

Claims 19-23, 29 and 30 are dependent on and further limit claim 18. Since claim 18 is believed allowable for the reasons discussed above, claims 19-23, 29 and 30 are also believed allowable for at least the same reasons as claim 18.

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NEW CLAIMS:Claim 27:

Claims 27 is dependent on claim 1 and recites, "The trace cover of claim 1, wherein the trace cover is mechanically attached to a top surface of the circuit board after manufacture of the circuit board." No new subject matter is introduced by claim 27, with support for the subject matter of claim 27 found at least at Figure 4, items 402, 404 and 406.

Shimada and Jones, either alone or in combination, do not disclose mechanically attaching a trace cover to a top surface of a circuit board after manufacture of the circuit board. Both references describe assemblies with incorporated shielding.

For at least this reason, and the reasons given for claim 1, claim 27 is believed allowable over the cited art. The Applicants therefore earnestly request allowance of claim 27.

Claim 28:

Claims 28 is dependent on claim 1 and recites, "The trace cover of claim 1, wherein the conductive trace is on an outer surface of the circuit board." No new subject matter is introduced by claim 28, with support for the subject matter of claim 28 found at least at Figure 1, item 116.

Shimada and Jones, either alone or in combination, do not disclose a conductive trace (which the trace cover is disposed substantially over) on an outer surface of the circuit board. Both references describe assemblies with incorporated shielding that encircles the wire being shielded.

For at least this reason, and the reasons given for claim 1, claim 28 is believed allowable over the cited art. The Applicants therefore earnestly request allowance of claim 28.

Claim 29:

Claims 29 is dependent on claim 1 and recites, "The trace cover of claim 1, wherein the trace cover is separate from the circuit board and is configured to be attachable to the circuit board during circuit board component attachment." No new subject matter is introduced by claim 29, with support for this claim found at least at page 5, lines 11-13.

As discussed above, Shimada and Jones do not disclose a trace cover separate from the circuit board. Thus, there is no teaching in either reference of a trace cover configured to be soldered to the circuit board in

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a same process step as other components, and to be assembled by a pick and place machine.

For at least this reason, and the reasons articulated for claim 1, claim 29 is believed allowable over the cited art. The Applicants therefore earnestly request allowance of claim 29.

Claims 30 and 31:

Claims 30 and 31 recite similar subject matter as claims 28 and 29, respectively. Thus, claims 30 and 31 are believed allowable for the similar reasons as claims 28 and 29.


CONCLUSION

In view of the forgoing remarks, it is respectfully submitted that this case is now in condition for allowance and such action is respectfully requested. If any points remain at issue that the Examiner feels could best be resolved by a telephone interview, the Examiner is urged to contact the attorney below.

No fee is believed due with this Amendment, however, should such a fee be required please charge Deposit Account 09-0466. Should any extensions of time be required, please consider this a petition thereof and charge Deposit Account 09-0466 the required fee.

Respectfully submitted,

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